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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Primary sources of $PM_{2.5}$ organic aerosol in an industrial Mediterranean city, Marseille" *by* I. El Haddad et al.

Anonymous Referee #3

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General comments:

This paper uses the CMB model to resolve primary sources of fine organic particles in Marseille that is influenced by a variety of sources. The markers of the primary sources are carefully selected, and the uncertainties are estimated, providing a comprehensive analysis of the sources. The independent and complementary radiocarbon measurements and further comparison with the CMB results confirm the robustness of the results. The paper is recommended to be published in ACP after revision. Some specific comments are listed below.

Specific comments:

1. In section "Organic markers analysis": "compounds for which no authentic standards

are available are quantified using the response factor of compounds with analogous chemical structures", is the uncertainty for this method estimated? Is there a reference paper?

2. In section "PM2.5 overall composition", an OM-to-OC conversion factor of 1.67 is inferred from the comparison between AMS and LPI measurements. OM-to-OC ratio is indicative of the oxidation of the particles. From Figure 7(a) shows the SOA/HOA varies, indicating the variation of OM-to-OC ratio; is the conversion factor for each day different? A conversion factor for each day could be applied.

3. In Figure 6, it seems only one sample is shown for levoglucosan, please explain.

4. Dust could be a major source for fine particulate organics (Schauer et al., 1996), why dust is not considered in the CMB model? Although the contribution of dust is roughly estimated by the PM-to-Al ratio.

5. Figure 7, the CMB fossil TC compares very well with the total fossil TC. Does the good agreement suggest that the CMB SOA is from non-fossil precursors? If yes, what could be the precursors of the CMB SOA?

6. Since there are AMS measurements, it would be more convincing to compare the CMB results with AMS factors, e.g. HOA, OOA, etc., as mentioned in the instruction on Page 5.

Technical corrections:

1. Page 11, Line 17: "encompass" should be "encompasses".

Reference:

Schauer JJ, et al. Source apportionment of airborn particulate matter using organic compounds as tracers. Atmospheric Environmental, 30 (22), 3837-3855.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 25435, 2010.